THE OUTLOOK (CONTINUED)

that a machine may have ample lift when its wheels are but a few feet above the ground, but as soon as the height between rotor and ground is increased to a little more than the rotor diameter, the ground effect disappears, and there is a great falling off in lift. Fortunately, the effect is beneficial in the oposite direction in that there is a great deal of "cushioning" when the machine is landing.

For fairly obvious reasons Professor Focke does not disclose the mechanical details of his incidence mechanism, but flight tests have shown that the time lag between direct-lift flight and gliding flight need not be more than two seconds, so obviously the mechanism, whatever it is, is effective.

Already the F.W.61 holds helicopter records with 1 hour 20 mins. duration, 68 miles distance, 8,000ft. altitude and 76 m.p.h speed. The rest is a matter of logical development.

The Long View

AFTER perusing Mr. Miles's project for a long-range passenger-carrier no one can accuse British aircraft designers of lack of imagination. In his "X" design Mr. Miles has incorporated all that modern knowledge can suggest. The layout, illustrated on this page, is an approach to the *Nurflügel* (all-wing) aircraft visualised more than twenty years ago by the late Professor Junkers, who actually took out patents to cover his ideas.

The attraction of the all-wing type of aircraft is, of course, that the maximum L/D ratio is that of the familiar wing model tested in the wind tunnel, which may well reach a value of twenty or more, whereas even a very clean aeroplane with fuselage and tail rarely reaches a maximum L/D of more than 15.

As has frequently been pointed out in *Flight*, an aeroplane flies most economically at the speed corresponding to maximum L/D, but, unfortunately, this ratio occurs closer to the minimum than to the maximum speed, so that unless the wing loading is high, the cruising speed is likely to be disappointingly low, and it is usually necessary to fly at some greater speed, at which the L/D ratio is less good.

In the Miles "X" design a compromise has been established, in which the fuselage and tail of the orthodox aircraft have been retained, but the wing thickness near the body has been made so great that the wing root merges smoothly into the curves of the fuselage. Many years ago the Westland Aircraft Works built a monoplane to the ideas of one Woyevodsky, in which something of the same sort was attempted, although the two machines are not comparable because in the Woyevodsky design the fuselage was deliberately made of lifting section, the idea being that it should carry its share of the load. That machine crashed on its first test flight, seriously injuring Capt. Keep, and the experiment was not repeated.

That Mr. Miles has achieved real improvement in efficiency in his "X" design is shown by the fact that when the wing loading is increased to some 35 pounds per square foot, the range goes up to well over 4,000 miles in still air, and that at a cruising speed of about 275 m.p.h. It is very much to be hoped that Air Ministry assistance will be found for building at least the "flying scale model" suggested by Mr. Miles. The experiment is one which ought to be made.

Naval Views of the Air

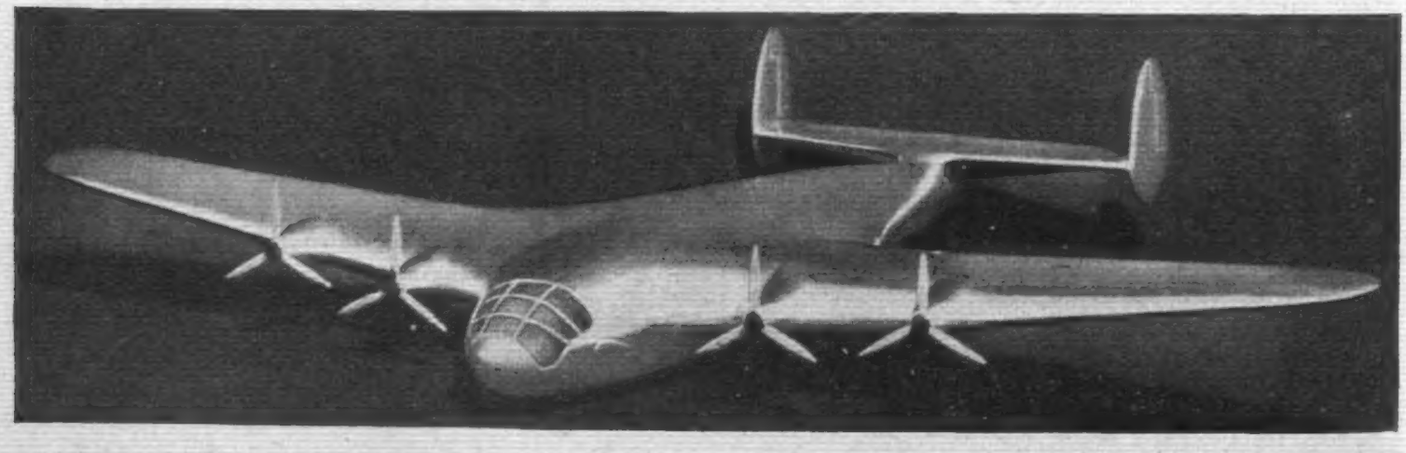
IT is always interesting to learn what naval men think of aircraft, and it has become more interesting than ever now that the Admiralty has been given complete control of its Air Arm. The articles in the 1938 issue of *Brassey's Naval Annual*, which has just been published, are therefore particularly worthy of study.

In this, as in previous editions of the *Annual*, it is evident that naval opinion is not unanimous on all points. For instance, one writer who signs himself "Securus" says that aircraft are able to a considerable extent to deprive the submarine of its greatly prized invisibility. On another page "Observer" writes that submarines always have been and always will be very difficult to see from the air, and that it is a misuse of aircraft to attempt to search for them submerged. Can it be that the former writer is thinking of the Mediterranean and the latter of the murky waters of the North Sea?

Again, "Observer" holds that shore-based aircraft cannot carry out any extensive patrol of the ocean routes, and asserts that to patrol at a radius of 250 miles over an arc of 180 degrees would require 40 aircraft in action and a total of 240 to provide a system of reliefs. As against this, the chapter on Foreign Fleet Air Arms states that the U.S. Navy maintains large flying boats of great endurance to patrol the vast triangle between the bases of Hawaii, the Aleutian Islands, and the Canal Zone. The snag in "Observer's" calculations probably is that he insists that his flying boats must not be more than 20 miles apart, and seems to visualise them as standing still when they have reached their position on the arc. Actually they would quest to and fro, and so a much smaller number than 40 would suffice.

The Larger Issues

THE two most important questions to which one would like to know the answers are: What will be the effect of aircraft on sea communications, and what will be their effect on fleet actions? It is agreed on all hands that harbours and naval bases will be less secure than they have been in the past. When aircraft can attack either they may do much destruction, and this fact tells most heavily against the stronger naval Power, and



NOT-SO-UNKNOWN QUANTITY: A wind-tunnel model of the projected 300-m.p.h. Miles X.2 four-engined transport, some comments on which appear above. Although the layout is unorthodox in a number of senses no new problems in stability and control are nvolved.